DOCUMENT RESUME

ED 123 362 RC 009 264

AUTHOR Williams, Anne S.; Dick, Kitty K.
TITLE An Assessment of Public Services in Selected Eastern Montana Counties.
INSTITUTION Montana State Univ., Bozeman. Montana Agricultural Experiment Station.
SPONS AGENCY Department of Agriculture, Washington, D.C.
REPORT NO MAES-85.
PUB DATE Sep 75
NOTE 54p.

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage.
DESCRIPTORS *Delivery Systems; Demography; *Evaluation; Health Facilities; Health Personnel; *Health Services; Models; Regional Planning; *Rural Areas; Rural Urban Differences; Social Characteristics; *Social Services; Surveys
IDENTIFIERS *Montana

ABSTRACT

Study objectives were to: describe existing government and health care services in 6 selected counties of eastern Montana; identify the demographic, geographic, and social characteristics affecting rural social service delivery systems; and suggest policy and organizational alternatives. County knowledgables were surveyed to determine the type and adequacy of available health and government services in the 6 counties, and health care services in 20 eastern Montana counties were inventoried to determine the ratio between population and health personnel and facilities. Findings indicated: the more sparsely populated counties had fewer medical facilities and personnel than their urban counterparts; many eastern Montana residents lived in isolated areas along poor transportation routes; medical facilities and personnel were located in the larger urban areas; rural residents tended to expect less health care and engage in more self-treatment than urban residents; rural health service problems were comparable to rural government service problems (i.e., geographic isolation, sparse population, and financial shortages). Suggested alternatives were: multi-legged service delivery centers (communities assigned a single service responsibility); the circuit rider concept (regional specialists); computerized coordination (interagency communication/cooperation). (JC)

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ED124362

An Assessment of Public Services in Selected Eastern Montana Counties

RC009264

Montana Agricultural Experiment Station
Montana State University, Bozeman

Research Report 85
Sept. 1975

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AN ASSESSMENT OF PUBLIC SERVICES IN SELECTED EASTERN MONTANA COUNTIES

by

Anne S. Williams
Kitty K. Dick

DEPARTMENT OF SOCIOLOGY
AND
MONTANA AGRICULTURAL EXPERIMENT STATION
Montana State University, Bozeman

August, 1975

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ACKNOWLEDGMENTS

The research described in the following pages is an outcome of Regional Research Project W-114, "Institutional Structures for Improving Rural Community Services," authorized by the Western Association of Agricultural Experiment Station Directors and financed by the Regional Research Fund, United States Department of Agriculture. Participants in the Western Regional Project included sociologists and economists in the Agricultural Experiment Stations of eleven state universities and representatives of the Economic Research Service and the Cooperative State Research Service, United States Department of Agriculture. This manuscript represents one contribution of the Montana Agricultural Experiment Station to the objectives of Regional Research Project W-114.

Many individuals were instrumental, either directly or indirectly, in the preparation of this report, but most importantly, the service providers within the study area provided the basic data upon which the conclusions of this study are based. June Brown, Dorothy Bradley, and Gerald Navratil, all Research Associates in the Institute of Applied Research, were responsible for the bulk of the field work. Doran Moore, Research Assistant in the Institute, collected most of the secondary data which are reported in the following pages. Elizabeth Hurley, Program Associate in the Institute,

offered technical and editorial assistance, and Phyllis Geldof exhibited extreme patience and care in typing previous drafts as well as the final copy of this manuscript. Finally, Dr. Del Samson, Head of the Montana State University Sociology Department, provided administrative and intellectual support throughout the project. For each of their contributions, the authors wish to acknowledge these individuals for their generous, cooperative, and enthusiastic support.

Anne S. Williams is Assistant Professor of Sociology at Montana State University, Bozeman. Kitty K. Dick was formerly Research Associate in the Institute of Applied Research at Montana State University.

INTRODUCTION

Montana, as well as a number of other states in the Northern Great Plains, has experienced erratic and uncertain growth in recent years (see Table 1). An important contributor to this uncertain growth is that all of these states export a great many young people, thereby losing a most important resource for development. In quantitative terms, the annual direct cost of educating the 5,700 people who migrate annually from Montana was roughly $65 million in 1970 (1:89).*

At the same time, Montana's average income is declining relative to the national average. Per capita income has been consistently below the national average since 1953. The last year in which state income approached the national average was 1958, and since then the gap has progressively widened. This decline in income has had a serious impact on many of the medium-sized and small communities throughout Montana, particularly in the eastern part of the state. Income inequity is also a regional problem; Idaho, New Mexico, North Dakota, South Dakota, and Utah all had per capita incomes lower than Montana's in 1969.

The 1970 census demonstrates that the population of a number of Plains states is increasing at a rate far below the national average, while North Dakota and South Dakota have lost population

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*References are contained in Appendix B to this report.

Table 1

STATE POPULATION CHANGES, 1960-70

PLAINS STATES[a]

State	Net Change	Total Number of Counties	No. Counties Losing Pop.	Percentage of Counties Losing Pop.
Colorado	+25.8%	63	32	50.8%
Kansas	+ 3.1%	105	75	71.4%
Montana	+ 2.9%	56	41	73.02%
Nebraska	+ 5.1%	93	67	72.0%
North Dakota	- 2.3%	53	47	88.7%
South Dakota	- 2.2%	67	53	79.1%
Wyoming	+ 0.7%	23	15	65.2%

[a] 1970 Census of Population, U.S. Department of Commerce, Bureau of the Census.

during the past decade (see Table 1). Even more serious is the fact that out-migration is heavily weighted toward those persons in the prime productive age categories (20 to 55 years old), while the proportion of dependent younger and older people is increasing. It is not uncommon to find disproportionately large concentrations of the aged, the disabled, the very young, and the poor in many rural communities (2:611). Although some small towns are able to maintain their population level, the tendency is for younger, more educated residents to migrate to the larger urbanized areas (3:178). This migration may negatively affect the service capability and efficiency of the rural community as potential leaders leave the area, and as rural services are curtailed or withdrawn entirely (3:178).

At the same time, a system of larger regional trade centers is developing, accompanied by a decline in the competitive capability of the surrounding, smaller communities (5:63). Wider penetration by larger trade centers is evident particularly in the more rural, agricultural areas (4:16). The probable future of many small "shopping center" communities may well be to gradually cease functioning as such (3:178). One study suggests that towns must have a population of at least 5,000 persons and market radius of about 25 miles to maintain economic viability (3:181). The Committee for Economic Development* stated in its 1966 report

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*The Committee for Economic Development is a non-profit, non-partisan group composed of 200 leading businessmen and educators and supported by voluntary contributions from business and industry.

that "very few local units are large enough--in population, area, or taxable resource--to apply modern methods in solving current and future problems" (7:11). This is to say that the existing institutional and demographic structures do not provide the right combination of factors to maintain community viability.

The drive toward efficiency is a cornerstone of this process of centralization. Efficiency is commonly conceptualized as performance of services without a waste of funds, and the assumption is made that efficiency increases with size. Thus, governmental reform has in practice meant advocating an increase in jurisdictional size. In brief, this has been viewed as the cure to problems of service delivery reorganization.

Recently, however, a small group of political economists have taken a quite different approach. G.J. Stigler, for example, has argued that "if we give each governmental activity to the smallest governmental unit which can efficiently perform it, there will be a vast resurgence and revitalization of local government in America (9:146)." In addition, there is fairly good evidence that some public services are provided most efficiently on a large scale, some on a small scale, while in others there appear to be neither economies nor dis-economies of scale (10:332). Economies of scale exist in supplying sewage treatment and public health programs, but not in producing primary education and police protection. Briefly, the average unit cost of providing various services depends upon the specific service provided. Large

scale production does not necessarily lead to efficiency; at times it is counter-productive. There is no single optimal size for providing all types of public goods and services and there is no simple division rule that specifies what the optimal size might be.

Carl F. Kraenzel has conducted extensive studies of "the social cost of space" (11:349-350). His findings suggest that costs of services per individual are substantially higher in areas of sparse population as compared to more densely populated or urbanized areas. Out-migration has resulted in continuing increases in the costs of services and to a considerable degree, decreases in locally available opportunities for health care and a variety of retail services. Recent work by Kraenzel has particularly emphasized the inadequacies of mental health care and the high incidence of mental health problems in sparsely populated regions (13); he suggests that high "social costs of space" lead to higher economic costs over time unless preventative efforts are instituted. What may be required then, is a new set of "co-operative arrangements" among communities designed to produce a system of services so that high quality can be provided at the most economical scale for the specific service.

THE STUDY

The research reported in the following pages is a preliminary attempt to examine the types and quality of public services available in sparsely settled rural areas of eastern Montana. Recognizing that the "quality" of rural living is dependent in part upon the types and "quality" of available community services, this research has attempted to explore more fully the "social cost of space" issue pioneered in the work of Carl F. Kraenzel. It is important to recognize, however, that because of abundant space and limited financial and human resources in sparsely settled areas, the standards by which "adequacy" of community services are judged are quite different than in more urbanized areas.

OBJECTIVES

The objectives of this research effort were:

1. To describe existing government services and health care services in six selected counties of eastern Montana.

2. To identify the demographic, geographic, and social characteristics which affect the provision and delivery of government and health care services to six eastern Montana counties.

3. To suggest alternative policies and patterns of organization to more effectively plan and coordinate the delivery of government and health care services to sparsely populated rural communities and/or counties.

PROCEDURES

In the spring of 1972, a pilot study of three Montana communities in Richland County was initiated. These communities were Sidney, Lambert, and Fairview. During the pilot study, interview schedules were developed, pre-tested, modified, and finally, administered to assess the quality and extent of government services and health care services in Richland County. The questionnaire consisted of a series of structured, open-ended questions designed to elicit information concerning: (1) the type of health and local government services available in the study areas; and (2) respondents' subjective evaluations of the "adequacy" of these services. Using an identical questionnaire, the field work was expanded during the summer of 1972, to include the following additional eastern Montana counties: Custer, Daniels, McCone, Phillips, and Powder River. Data previously gathered during the pilot study were added to the data generated from this larger study.

Selection of Six Study Counties

An effort was made to select six counties representative of the diverse economic and social conditions in the eastern part of Montana. Six indicators were used in assessing the economic and social conditions within all of the 18 eastern Montana counties. These indicators included: (1) percentage of population below poverty level; (2) median family income; (3) unemployment rate; (4) median educational achievement; (5) percentage of dilapidated

housing; and (6) ratio of population per square mile. Table 2 displays these county characteristics for the six study counties, as well as for the remaining twelve counties in eastern Montana which were not selected for in-depth study.

Selection of Respondents

The number of respondents sampled from each of the communities in the six study counties was quite small; however, this information does provide a partial picture of the status of health care and local government services in each of the communities surveyed. It should be emphasized that this was a "subjective" evaluation of local health care and government services; that is, respondents were asked their opinions or attitudes regarding the adequacy of local public services, and no attempt was made to evaluate health and local government services in a more "objective" fashion, or to compare available services in one community to those available elsewhere.

The majority of respondents were classified as "knowledgable"; that is, only those citizens who held official positions in the community or who were otherwise active in town affairs were interviewed. In some cases, respondents were actively involved in the delivery of the services they were asked to evaluate and, in other cases, the respondent had recently used the service or had previously been involved in delivery of the service.

Table 2

SELECTED CHARACTERISTICS OF EIGHTEEN EASTERN MONTANA COUNTIES

COUNTY	Population 1950[a]	Population 1970[b]	Percentage of Change[a] 1950 - 1970	Pop. per Sq. Mile 1970[b]	Percentage of Pop. Below Poverty Level 1969[c]	Median Family Income 1969[d]	Unemployment Rate 1970[e]	Percentage of Dilap. Housing 1970[f]	Median Education Level 1970[b]
Carter	2,798	1,956	-30.1%	0.6	17.5%	$8,607	2.4%	56.4%	12.3
CUSTER*	12,651	12,174	- 3.8%	3.2	11.6%	$8,373	4.7%	25.9%	12.2
DANIELS*	3,946	3,083	-21.9%	2.1	10.1%	$7,754	.4%	43.4%	12.1
Dawson	9,092	11,269	+23.9%	4.7	8.4%	$9,133	3.1%	27.1%	12.1
Fallon	3,660	4,050	+10.7%	2.5	12.6%	$8,888	5.4%	37.9%	11.5
Garfield	2,172	1,796	-17.3%	0.4	17.3%	$6,657	2.3%	26.0%	12.1
McCONE*	3,258	2,875	-11.8%	1.1	13.8%	$8,339	2.3%	39.1%	12.1
Petroleum	1,026	675	-34.2%	0.4	17.8%	$7,315	--	64.9%	12.2
PHILLIPS*	6,334	5,421	-14.4%	1.0	16.6%	$7,231	4.3%	44.4%	12.1
POWDER RIVER*	2,693	2,862	+ 6.3%	0.9	13.0%	$7,965	2.9%	47.5%	12.2
Prairie	2,377	1,752	-26.3%	1.0	19.1%	$7,366	1.4%	33.8%	11.4
RICHLAND*	10,366	9,837	- 5.1%	4.7	13.8%	$7,767	4.4%	36.5%	11.7
Roosevelt	9,580	10,365	+ 8.2%	4.3	23.3%	$7,955	8.8%	43.3%	11.6
Rosebud	6,570	6,032	- 8.2%	1.2	25.8%	$6,717	4.6%	45.2%	11.5
Sheridan	6,674	5,779	-13.4%	3.4	11.4%	$8,605	3.0%	40.0%	12.0
Treasure	1,402	1,069	-23.8%	1.1	22.8%	$6,955	1.3%	49.2%	12.4
Valley	11,353	11,471	+ 1.0%	2.2	16.8%	$8,191	5.1%	29.6%	12.1
Wibaux	1,907	1,465	-23.2%	1.6	15.2%	$7,300	.9%	34.6%	12.1
Montana	591,024	694,409	+17.5%	4.7	11.0%	$8,509	6.2%	36.0%[g]	12.3

*Selected as study counties.

[a] Montana Data Book. Dept. of Planning and Economic Development. State of Montana, Helena, 4:10, 1970.

[b] Number of Inhabitants, Montana. 1970 Census of Population. U.S. Dept. of Commerce. Bureau of the Census. PC(1)-A28, Mont. Table 9.

[c] U.S. Bureau of the Census, Census of Population: 1970, Vol. 1, Characteristics of the Population, Part 28, Montana, Table 124.

[d] General Population Characteristics, Montana 1970 Census of Population, U.S. Dept. of Commerce. Bureau of the Census PC(1)-C28 Mont. Table 124.

[e] County and City Data Book 1972, Bureau of the Census, U.S. Dept. of Commerce, P. 284.

[f] Community Profile. Office of Economic Opportunity. Information Center.

[g] The figure reported is for the entire United States; comparable data for the state of Montana were not available.

Community Health Services Inventory

Using the yellow pages of telephone directories, health care services in the twenty eastern Montana counties were inventoried. However, a high probability of error is associated with this method of data collection, since not all health service providers advertise their services in the yellow pages. In fact, failure to list services in the yellow pages of the telephone directories appeared to be so common in the smallest communities surveyed, that in these communities the white pages of the directories were also searched in an effort to reduce the incidence of error. Even so, readers who are quite familiar with the study communities will easily recognize errors in the listing. However, these data provide a general indicator of the range of available health care services in the study communities, and as such are a useful complement to the interview data.

Ratios of medical personnel and facilities relative to population were also developed for twenty of the eastern Montana counties. These ratios were calculated from secondary data sources by listing the total population of each of the twenty counties and dividing the county population figure by the number of medical personnel and facilities available in each county. Ratios were developed for physicians, dentists, optometrists, registered nurses, licensed practical nurses, pharmacists, hospital beds, and retirement (nursing home) beds in each of the twenty counties.

OVERVIEW

Because of the limited number of respondents interviewed in each community, no attempt has been made to provide statistical summaries or other statistical analyses of the public services data.* However, pertinent demographic characteristics of the study counties are presented in Appendix A.

HEALTH CARE SERVICES

Ratios of Health Care Personnel and Facilities to Population

The ratios of health care personnel and facilities to population are indicators of health service adequacy. For the twenty eastern Montana counties, data were collected from secondary sources to examine the ratios of health care personnel and facilities to population; these data are displayed in Table 3. By comparing the ratios for the twenty counties with the national averages for each of the health care personnel and facilities listed, it is apparent that none of the twenty eastern Montana counties have comparable numbers of physicians, pharmacists, or nursing beds for the populations in their areas. Furthermore, if the national averages are considered reliable standards, only one county has enough licensed practical nurses, and this county (Carter) does not have adequate nursing home facilities, hospital beds or other medical personnel. Only five of the twenty eastern

*Detailed results are available in "Inventory of Health Care and Local Government Services in Six Selected Eastern Montana Counties," Institute of Applied Research, Montana State University, Bozeman, 1975 (mimeograph).

Montana counties have enough registered nurses, and two of the five (Carter and Big Horn) presently experience shortages of other health care personnel and health care facilities. Only two counties have enough hospital beds (Custer and Roosevelt), and only two counties have enough optometrists (Richland and Dawson). Furthermore, only three of the twenty counties (Yellowstone, Valley, and Sheridan) have enough dentists per population. Judging by the ratios of medical personnel and facilities per capita in the twenty eastern Montana counties, the three counties of Yellowstone, Custer, and Richland appear to best equipped to provide health care services to their local populations.

The ratios of medical personnel and facilities per population are summarized, in Table 4, by geographic area. The twenty counties have been grouped into three distinct geographic areas--northern counties, central counties, and southern counties--and, each of these three areas has been separated into western or eastern counties. As Table 4 illustrates, the five northern counties (Phillips, Valley, Daniels, Sheridan, and Roosevelt) have fewer physicians, dentists and RN's per population than the central or southern counties. The central counties (Petroleum, Garfield, McCone, Prairie, Wibaux, Dawson, and Richland) have the fewest number of LPN's, pharmacists, hospital beds and nursing home beds per population, as compared to the northern and the central counties. Table 4 clearly indicates that even when the twenty eastern Montana counties are grouped into geographic areas, no single

Table 3

TWENTY EASTERN MONTANA COUNTIES--
RATIO OF HEALTH CARE PERSONNEL AND
FACILITIES PER POPULATION

COUNTY	Total Land Area[a] (Sq. Miles)	Population[a]	Population per Sq. Mile[a]	No. of Physicians[b]	Ratio of Physicians Per Population	No. of Dentists[b]	Ratio of Dentists Per Population	No. of Registered Nurses (RN's)[b]	Ratio of RN's Per Population	No. of Licensed Practical Nurses (LPN's)[b]	Ratio of LPN's Per Population	No. of Optometrists[b]	Ratio of Optometrists Per Population	No. of Pharmacists[b]	Ratio of Pharmacists Per Population	No. of Hospital Beds[c]	Ratio of Hospital Beds Per Population	Population Aged 65 Years and Over[d]	No. of Retirement and Nursing Home Beds[c]	Ratio of Retirement and Nursing Home Beds Per Pop. Aged 65 Yrs.+
Big Horn	5,023	10,057	2.0	2	1:5029	1	1:10057	34.0	1:296	7	1:1437	0.5	1:20114	3	1:3352	18	1:559	693	32	1:22
Carter	3,313	1,956	0.6	1	1:1956	0	--	9.0	1:217	7	1:279	0	--	1	1:1956	16	1:222	267	21	1:13
Custer	3,756	12,174	3.2	19	1:641	5	1:2435	49.0	1:248	28	1:435	2	1:6087	13	1:936	124	1:98	1,550	145	1:11
Daniels	1,443	3,083	2.1	2	1:1542	0	--	7.5	1:411	3	1:1028	0	--	1	1:3083	20	1:154	450	19	1:24
Dawson	2,370	11,269	4.8	6	1:1878	5	1:2254	28.0	1:402	12	1:939	3	1:3756	5	1:2254	46	1:245	994	49	1:20
Fallon	1,633	4,050	2.5	2	1:2025	0	--	5.5	1:736	8	1:506	0	--	2	1:2025	29	1:140	358	22	1:16
Garfield	4,455	1,796	0.4	0	--	0	--	2.5	1:718	2	1:898	0	--	2	1:898	8	1:225	165	12	1:14
McCone	2,607	2,875	1.1	1	1:2875	1	1:2875	3.5	1:821	0	--	0	--	0	--	20	1:144	287	0	--
Petroleum	1,655	675	0.4	0	--	0	--	0.0	--	0	--	0	--	0	--	0	--	47	0	--
Phillips	5,213	5,386	1.0	2	1:2693	1	1:5386	7.0	1:769	7	1:769	1	1:5386	3	1:1795	30	1:180	720	35	1:21
Power River	3,288	2,862	0.9	1	1:2862	0	--	1.0	1:2862	0	--	0	--	1	1:2862	0	--	225	0	--
Prairie	1,730	1,752	1.0	0	--	0	--	9.5	1:184	1	1:1752	0	--	1	1:1752	0	--	240	10	1:24
Richland	2,079	9,837	4.7	8	1:1230	4	1:2459	23.0	1:428	24	1:410	3	1:3279	9	1:1093	55	1:179	1,029	85	1:12
Roosevelt	2,385	10,365	4.3	6	1:1728	2	1:5183	24.0	1:432	21	1:494	2	1:5183	5	1:2073	89	1:116	992	80	1:12
Rosebud	5,037	6,032	1.2	2	1:3016	1	1:6032	7.5	1:804	11	1:548	0	--	2	1:3016	20	1:302	614	25	1:25
Sheridan	1,694	5,779	3.4	3	1:1926	3	1:1926	14.0	1:413	8	1:722	1	1:5779	4	1:1445	26	1:222	676	81	1:8
Treasure	985	1,069	1.1	0	--	0	--	2.0	1:535	0	--	0	--	0	--	0	--	113	0	--
Valley	4,974	11,471	2.3	5	1:2294	6	1:1912	15.5	1:740	18	1:637	2	1:5736	8	1:1434	68	1:169	996	60	1:17
Wibaux	890	1,465	1.6	0	--	0	--	0.0	--	0	--	0	--	0	--	0	--	180	0	--
Yellowstone	2,642	87,367	33.1	141	1:620	56	1:1560	591.0	1:148	165	1:529	8	1:10921	62	1:1409	393	1:222	7,064	478	1:15
NATIONAL AVERAGE					1:575[e]		1:2128[e]		1:319[e]		1:333[f]		1:4545[g]		1:699[g]		1:133[h]			N.A.[i]

[a]Number of Inhabitants--Montana 1970 Census of Population, U.S. Department of Commerce, Bureau of the Census, PC(1)A28 Mont. Table 9.
[b]Comprehensive Health Planning Commission, State Dept. of Health, Helena, Montana, 1973.
[c]Regional Handbook: A Regional View of Montana, Concerted Services, Roundup, Montana, 1973.
[d]General Population Characteristics, Montana, 1970 Census of Population, U.S. Dept. of Commerce, Bureau of the Census, PC(1)B28 Mont. Table35.
[e]Statistical Abstract of the United States, 1973, U.S. Dept. of Commerce, Bureau of the Census, No. 106, p-72.
[f]Statistical Abstract of the United States, 1973, U.S. Dept. of Commerce, Bureau of the Census, No. 108, p-73. (Calculated from figures on this table.)
[g]Characteristics of the Population, Vol. 1, Part 1, U.S. Summary, Section 2, Table 222, 1970 Census of Population, U.S. Dept. of Commerce, Bureau of the Census (Calculated from figures on this Table.).
[h]Statistical Abstract of the United States, 1973, U.S. Dept. of Commerce, Bureau of the Census, No. 109, p-74.
[i]Not available.

Table 4

SUMMARY OF HEALTH CARE PERSONNEL AND FACILITIES--
TWENTY EASTERN MONTANA COUNTIES

	Total Land Area[a] (Sq. Miles)	Population[a]	Population Per Sq. Mile	No. of Physicians[b]	Ratio of Physicians Per Population	No. of Dentists[b]	Ratio of Dentists Per Population	No. of Registered Nurses (RN's)[b]	Ratio of RN's Per Population	No. of Licensed Practical Nurses (LPN's)[b]	Ratio of LPN's Per Population	No. of Optometrists[b]	Ratio of Optometrists Per Population	No. of Pharmacists[b]	Ratio of Pharmacists Per Population	No. of Hospital Beds[b]	Ratio of Hospital Beds Per Population	Population Aged 65 Years and Over[d]	No. of Retirement and Nursing Home Beds[c]	Ratio of Retirement and Nursing Home Beds Per Pop. Aged 65 Yrs. and Over
NORTHWESTERN COUNTIES Phillips, Valley	10,187	16,857	1.7	7	1:2408	7	1:2408	22.5	1:749	25	1:674	3.0	1:5619	11	1:1532	98	1:172	1,716	95	1:18
NORTHEASTERN COUNTIES Daniels, Sheridan, Roosevelt	5,522	19,227	3.5	11	1:1748	5	1:3845	45.5	1:423	32	1:601	3.0	1:6409	10	1:1923	135	1:142	2,118	180	1:12
TOTAL--All Northern Counties	15,709	36,084	2.3	18	1:2005	12	1:3007	68.0	1:531	57	1:633	6.0	1:6014	21	1:1718	233	1:155	3,834	275	1:14
WEST CENTRAL COUNTIES Petroleum, Garfield	6,110	2,471	0.4	0	--	0	--	2.5	1:988	2	1:1236	0.0	--	2	1:1236	8	1:309	212	12	1:18
EAST CENTRAL COUNTIES McCone, Prairie, Wibaux, Dawson, Richland	9,676	27,198	2.8	15	1:1813	10	1:2720	64.0	1:425	37	1:735	6.0	1:4533	15	1:1813	121	1:225	2,730	144	1:19
TOTAL--All Central Counties	15,786	29,669	1.9	15	1:1978	10	1:2967	66.5	1:446	39	1:761	6.0	1:4945	17	1:1745	129	1:230	2,942	156	1:19
SOUTHEASTERN COUNTIES Rosebud, Treasure, Big Horn, Yellowstone	13,687	104,525	7.6	145	1:721	58	1:1802	634.5	1:165	183	1:571	8.5	1:12,297	67	1:1560	431	1:243	8,484	535	1:16
SOUTHEASTERN COUNTIES Custer, Fallon, Carter, Powder River	11,990	21,042	1.8	23	1:915	5	1:4208	64.5	1:326	43	1:489	2.0	1:10,521	17	1:1238	169	1:125	2,400	188	1:13
TOTAL--All Southern Counties	25,677	125,567	4.9	168	1:747	63	1:1993	699.0	1:180	226	1:556	10.5	1:11,959	84	1:1495	600	1:209	10,884	723	1:15
TOTAL--All Counties	57,172	191,320	3.3	201	1:952	85	1:2251	833.5	1:230	322	1:594	22.5	1:8503	122	1:1568	962	1:199	17,660	1154	1:15
NATIONAL AVERAGE					1:575[e]		1:2128[e]		1:319[e]		1:333[f]		1:4545[g]		1:699[g]		1:133[h]			N.A.[i]

[a] Number of Inhabitants--Montana 1970 Census of Population, U.S. Department of Commerce, Bureau of the Census, PC(1)A28 Mont. Table 9.
[b] Comprehensive Health Planning Commission, State Dept. of Health, Helena, Montana, 1973.
[c] Regional Handbook: A Regional View of Montana, Concerted Services, Roundup, Montana, 1973.
[d] General Population Characteristics, Montana, 1970 Census of Population, U.S. Dept. of Commerce, Bureau of the Census, PC(1)B28 Mont. Table35.
[e] Statistical Abstract of the United States, 1973, U.S. Dept. of Commerce, Bureau of the Census, No. 106, p-72.
[f] Statistical Abstract of the United States, 1973, U.S. Dept. of Commerce, Bureau of the Census, No. 108, p-73. (Calculated from figures on this table)
[g] Characteristics of the Population, Vol. 1, Part 1, U.S. Summary, Section 2, Table 222, 1970 Census of Population, U.S. Dept. of Commerce, Bureau of the Census (Calculated from figures on this Table.).
[h] Statistical Abstract of the United States, 1973, U.S. Dept. of Commerce, Bureau of the Census, No. 109, p-74.
[i] Not available.

geographic area has enough medical personnel and facilities per capita when compared to the national averages.

Guttman Scale

Using the yellow pages of the telephone directories, a Guttman Scale* of medical personnel and facilities was developed to illustrate the mix of medical facilities and personnel available in each of the towns located within the twenty eastern Montana counties. These data are shown in Table 5. Those communities having a greater number and variety of health care services are listed at the top of the table and those communities having fewer services are listed in declining order. This summary table allows one to anticipate what kinds of health care services are available in a community simply by looking at the last service listed. For example, a community having a dentist is also likely to offer the services listed to the left of that colum (i.e., hospital, physician/surgeon, and pharmacy).

The city of Billings, located in Yellowstone County, is the largest city within the twenty-county area and, as such, has assumed the position of regional trade center for the area. Billings clearly has the greatest variety and largest number of medical services and personnel. Even so, as Table 3 illustrates, Yellowstone

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* A Guttman Scale is simply a way of ranking variables (in this case, communities) into some kind of logical order. Very few scales achieve a perfect ranking of all variables. In the scale shown in Table 5, some communities offered services which did not fit the scale type; for example, Laurel has a city-based ambulance but does not offer the three services immediately to the left of that column. When deviations such as this occur in the scale, these are called "errors." A scale reliability score is then calculated, taking into consideration the number of errors which have occured. If the coefficient of reliability exceeds 90 percent, the scale is considered sufficiently accurate for use.

Table 5

Guttman Scale of Medical Personnel and Facilities--Twenty Eastern Montana Communities

COUNTY	TOWN	POPULATION	Pharmacy	Physicians/ Surgeons	Hospitals Dentists/ Orthodontists	Optometrists	Chiropracters	Nursing Homes	Medical Clinic	Mental Health Clinic	Alcoholism/Drug Center	City-Based Ambulance	Medical Laboratory	Mental Laboratory	ERRORS
Yellowstone	Billings	61,581	17	135	2	54	7	11	5	6	1	4	3	1	5	0
Valley	Glasgow	4,700	4	9	1	5	2	1	1	2	1	1	1	-	-	0
Dawson	Glendive	6,305	3	6	1	4	3	3	1	2	1	1	-	-	-	0
Big Horn	Hardin	2,733	3	1	1	1	2	1	2	1	1	2	-	-	-	0
Custer	Miles City	9,023	4	11	2	5	2	2	-	4	1	1	-	1	-	2
Richland	Sidney	4,543	2	2	1	4	3	2	1	2	-	-	-	-	-	0
Rosebud	Forsyth	1,873	1	2	1	1	-	1	1	1	-	-	-	-	-	1
Phillips	Malta	2,195	2	2	1	1	1	1	1	-	-	-	1	-	-	1
Sheridan	Plentywood	2,381	2	2	1	3	1	1	1	-	-	-	1	-	-	1
Roosevelt	Wolf Point	3,095	2	4	1	2	2	1	1	-	-	-	-	-	-	0
Yellowstone	Laurel	4,454	2	3	-	2	1	2	1	-	-	-	1	-	-	2
Fallon	Baker	2,584	2	2	1	1	1	-	-	-	1	-	-	-	-	1
McCone	Circle	964	1	1	1	1	-	-	-	-	-	-	-	-	-	0
Daniels	Scobey	1,486	1	2	1	-	-	-	1	-	-	-	-	-	-	1
Prairie	Terry	870	1	1	1	-	-	-	1	1	-	-	-	-	-	2
Carter	Ekalaka	663	1	1	1	-	-	-	-	-	-	-	1	-	-	1
Garfield	Jordon	529	1	1	1	-	-	-	-	-	-	-	-	-	-	0
Powder River	Broadus	799	1	1	-	-	-	-	-	1	-	-	1	-	-	2
Roosevelt	Poplar	1,389	1	-	1	-	-	-	-	1	-	-	-	-	-	2
Wibaux	Wibaux	644	1	-	-	-	-	-	-	-	-	-	-	-	-	0
Valley	Nashua	513	1	-	-	-	-	-	-	-	-	-	-	-	-	0
Sheridan	Medicine Lake	393	1	-	-	-	-	-	-	-	-	-	-	-	-	0
Roosevelt	Culbertson	821	1	-	-	-	-	-	-	-	-	-	-	-	-	0
Roosevelt	Froid	330	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Richland	Fairview	956	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Big Horn	Lodge Grass	806	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Treasure	Hysham	494	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Roosevelt	Brockton	401	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Petroleum	Winnet	271	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Fallon	Plevna	189	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Sheridan	Westby	287	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Roosevelt	Bainville	217	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Daniels	Flaxville	185	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Phillips	Dodson	196	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Yellowstone	Broadview	120	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Sheridan	Outlook	153	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Custer	Ismay	40	-	-	-	-	-	-	-	-	-	-	-	-	-	0
ERRORS*			0	0	2	0	1	0	3	3	1	0	5	1	0	16

* $\frac{465}{481}$ = 96.7 Coefficient of Reliability.

County (Billings), experiences shortages of most medical facilities and personnel.

The city of Glasgow, in Valley County (ranked second on the Guttman Scale), has a fairly good range of medical personnel and facilities. However, Valley County, like most of the twenty eastern Montana counties, does not have adequate numbers of medical personnel and hospital facilities for the population of the area when compared to the national averages (see Table 3).

The cities of Glendive (in Dawson County) and Hardin (in Big Horn County) ranked third and fourth, respectively, on the Guttman Scale. Although Big Horn County has a mix of medical services and personnel similar to that of Dawson County, the total number of facilities and personnel is much smaller in Big Horn than in Dawson County (see Table 3). This difference can no doubt be attributed to the considerably smaller population of Big Horn County.

The cities of Miles City (in Custer County) and Sidney (in Richland County) ranked fifth and sixth on the Guttman Scale. However, the ratios of medical personnel and facilities per population in Custer and Richland counties indicate that, compared to other counties in eastern Montana, these two counties are relatively well provided with medical personnel and facilities (see Table 3). These data indicate that, although Custer and Richland counties may not offer as wide a range of medical services and personnel as are available in Yellowstone, Valley, Dawson, and Big Horn counties, they do have more personnel and facilities per capita than all eastern Montana counties except Yellowstone.

General Findings

The above data indicate that residents in the more sparsely populated counties of eastern Montana clearly have fewer medical facilities and personnel immediately available to them than their urban counterparts. Furthermore, many eastern Montana residents live in relatively isolated areas at some distance from the major health service centers and also are situated along relatively poor highway and railway transportation routes. Petroleum and Garfield counties in the westcentral part of eastern Montana are obvious examples of this phenomenon.

With the exception of Billings, in Yellowstone County, highly specialized medical services are not available locally to the residents of eastern Montana. As a result, eastern Montanans must travel great distances and at considerable time and financial expense to have access to highly specialized medical facilities and many residents must travel relatively far to receive even general medical care. The limited availability of such services is due to the sparse population of the area and the high financial cost of providing adequate medical services; accordingly, medical personnel and facilities are located in the larger urbanized or urbanizing areas of the region. Rural residents adapt to this situation by learning to do without a full range of medical services. They learn to expect less health care treatment than their urban counterparts, and many believe that the current low level of medical services in their areas in "adequate." Rural residents become more self-reliant and administer considerably more self-treatment in cases of medical emergency. Furthermore,

they tend to postpone medical treatment and adapt by accepting the possible long-run costs of medical care postponement.

PROBLEMS OF PROVIDING ADEQUATE PUBLIC SERVICES TO RURAL AREAS

The problems described above are not unique to health care services, but rather affect the delivery of all types of public services to sparsely populated rural areas. Local, municipal, and county governments face many problems which are identical to those of the health care service providers. Interviews with providers of local government services in six of the twenty eastern Montana counties indicated that the relative isolation of the counties from major urban trade centers and the sparsity of the population combine to form formidable obstacles to the provision of adequate local government services.

Financial Problems

In the course of studying six of the twenty eastern Montana counties, the financial dilemma of municipal and county governments became painfully apparent. Service providers in the six study counties indicated, without exception, that they had difficulty finding the financial resources to provide the equipment, the facilities, and the supplies required for service provision. All service providers indicated that their municipal and county governments simply did not have enough money to adequately finance the minimum required municipal services. As a result, county and municipal governments were, in most cases, forced to provide low-level or

minimum local government services.

Citizen respondents also appreciated this dilemma and many stated that the local government officials were providing the best services they could, given the limited financial resources of their local governments. One county commissioner suggested that the counties should be allowed to levy additional taxes at their own discretion as local needs arise and that the state government should not be allowed to establish maximum millage rates for the county governments.

Service Personnel

The relative geographic isolation of most of Montana's eastern counties, the sparsity of population, and the shortage of financial resources impose difficult obstacles to adequate service delivery arrangements. Municipal and county governments presently experience serious difficulty in hiring qualified personnel to staff local government positions. Local governments in these areas simply do not have the financial resources and/or quality-of-living benefits to compete successfully for qualified service personnel. As a result, local government officials simply "make do" by hiring those persons who are available and most qualified to fill the positions. Shortages of qualified health care personnel were particularly evident, since many eastern Montana communities have failed to entice medical specialists or general physician practitioners to relocate in their communities. Shortages of qualified registered nurses and other medical personnel were also evident.

Geographic Isolation

As a state, Montana is relatively sparsely populated, but this factor is even more dramatic in the eastern Montana counties. For example, Garfield and Petroleum counties in eastern Montana have only 0.4 persons per square mile and the average population per square mile for the twenty eastern Montana counties is 3.3 persons. Only Yellowstone County, on the southwestern edge of the twenty eastern Montana counties is relatively heavily populated with 33.1 persons per square mile. Furthermore, the geographic area of the twenty eastern Montana counties is extremely large with a total land area of 57,172 square miles. The large geographic area which must be serviced and the very low level of population density combine to form formidable obstacles to adequate provision of municipal and health care services.

The climate of the area also becomes an obstacle to service delivery, particularly during harsh winter months when below-zero temperatures are quite common. Services such as fire protection, law enforcement, and road maintenance in these large, sparsely populated counties become particularly difficult to provide. In fact, a chief complaint of many government and health care service providers was that "the geographic expanse of the counties is simply too large to provide adequate services."

In areas of sparse population, where there are great distances between communities, it is difficult to adequately maintain and service existing roads and highways, to recruit qualified service personnel, and to offer refresher courses to service personnel.

Respondents also indicated that service providers did not often find time or opportunity to participate in refresher courses. The financial costs and time involved in traveling relatively far distances usually made this option unfeasible. As a result, rural residents in isolated geographic areas tend to develop feelings of disenfranchisement and isolation from the mainstream of society.

Since tax revenues from state government play an important role in supporting public services in rural areas of the state, respondents were asked if they felt the Montana State government was concerned about the problems of eastern Montana. The vast majority of respondents felt that state government was not concerned about the problems of eastern Montana. Reasons given for this lack of concern included: (1) because the area is so sparsely populated, citizens have a minimum of political influence; and (2) eastern Montana is too distant from the state capitol and the political power base.

Perception of Service Adequacy

Many long-time residents of eastern Montana would not agree that public services in their areas are "inadequate." Although respondents indicated some dissatisfaction with selected services within their communities, for the most part, respondents seemed to believe that local government officials did an admirable job of providing public services within the limits of the existing tax base. This general attitude prompted us to assess respondents' attitudes toward rural living, including what problems they foresaw

in providing community services to rural towns, what community problems their rural towns experienced, and what features detracted from living in a rural community.

Most respondents agreed that the major problems characteristic of rural communities were: (1) lack of financial resources to provide necessary community services; (2) inadequate public transportation systems into, and out of, the area (including air, rail, and bus); (3) severe shortage of adequate job opportunities (particularly for youth); (4) inadequate health care services (including a shortage of qualified physicians); (5) inadequate cultural and recreational opportunities nearby; and (6) a shortage of all types of locally available commercial shopping areas. One respondent summarized the dilemma of living in a sparsely settled geographic area by stating "we're always far from everything, and with the limited population and tax base, we simply can't provide the services necessary for a quality life." However, most respondents agreed that the social benefits of rural living far outweighed the above mentioned social costs and they preferred rural living, even with its handicaps, to living in an urban area.

METHODS OF IMPROVING RURAL COMMUNITY SERVICES

The boundaries of most existing rural organizational units were drawn at a time when social and economic activities were oriented to now obsolete forms of transportation and communication. Failure to adjust boundaries has often resulted in serious deficiencies in administrative effectiveness, increasing costs

for many public services, while failing to promote social and economic adaptation. As a result, "regional," "area," or "multi-county" organization and consolidation of service-delivery systems have become two of the principal vehicles for attempting to solve the social, economic, and political problems of rural America.

Multi-County Organizations

Multi-county organizational units have emerged largely as a consequence of the widening gap between the demands made upon government and its ability to respond. Local governments have not had the geographic breadth, legal power, or financial capability to deal with areawide problems. State governments have found it difficult to deal with the multiplicity of local jurisdictions originated for purposes of planning, administration, and economic or social development. Federal government lacks the local support or proximity to adapt national programs and priorities to the needs of sub-state areas. The inefficiencies and duplication at each level of government have greatly diluted the effectiveness of many well-intended public efforts. Local officials and citizens have often been immensely frustrated by the inability of any single governmental jurisdiction to solve problems or effectively influence existing or new state and federal programs.

Regional organization within states has in part met the need for more effective mechanisms to coordinate horizonatal integration among local units of government and vertical integration among layers of government at the area, state, and national levels.

But, the potential capability of such new organizational forms is yet to be fully realized in most parts of the United States.

Multi-county, area, or regional districting has been used primarily as a vehicle for collaboration among counties and municipalities on common problems and opportunities without creating a new layer of government. The new regional organizations have provided a general framework for comprehensive approaches to planning and development. They also provide an administrative channel to state and federal agencies for more efficient delivery and coordination of state and federal services.

A common theme among all the area organizations so far established is the concept of using a geographical area as a frame for re-organizing diverse development activities into a systematic area-wide program. A second characteristic premise is that the territorial area is a social unit within which problems and needs can be identified, programs formulated, leadership developed, and citizen support mobilized.

Two multi-county organizations were functioning within the study area during the time this fieldwork was undertaken. These two organizations were the Economic Development Association of Eastern Montana and Action for Eastern Montana (an Office of Economic Opportunity funded multi-county service program). Since these two organizations represented unique structural arrangements for attempting to provide services to the area, respondents were asked if they had heard of either of these programs. Most

respondents had heard of the Economic Development Association of Eastern Montana, although many stated that they did not know much of what the Association had done. Likewise, most respondents had heard of Action for Eastern Montana, although many respondents stated either they were not sure what it had done, or they did not think it had accomplished much.

Respondents were also asked if they felt it was worthwhile to develop multi-county organizations for the purpose of attempting to solve area-wide problems. The majority of respondents felt that multi-county organizations should be encouraged. However, respondents were concerned about the additional expense of such organizations and also about the impact of multi-county organizations upon local community identity. One county commissioner stated that "one of the big problems with these reforms is that nothing is ever done away with. The proposals always call for adding another level of government." On the other hand, some respondents stated that if similar geographic areas were grouped together, multi-county organizations could work on problems that no local government agency was attempting to solve and that such organizations would give the area greater political influence than it had under the existing system of individual political units.

In its ideal form, therefore, the multi-county organizational approach to service delivery does seem to be acceptable to many eastern Montana residents. It is obvious, however, that multi-county organizational units are not a panecea for the resolution of all rural, public service problems. Rather, they are perhaps

a tool that will be helpful only if designed and used with careful attention to their limited purposes. It may be appropriate to conclude that area organizations should attempt to fill the gaps that exist in the efficiency and effectiveness of existing jurisdictions, but should not necessarily attempt to replace existing governmental structures except in extreme instances when such structures are clearly no longer viable. Combining some presently inefficient local government functions could serve to strengthen representativeness--by allowing elected officials more time and resources to deal with the larger problems of planning and develment rather than supervising overlapping and inefficient public services. In this way, rural communities might hope to strengthen service integration at the local level, while also taking advantage of the resources and talent outside of their local communities.

RECOMMENDATIONS

MODELS OF ALTERNATIVE SERVICE DELIVERY SYSTEMS

The following organizational structures or models are suggested for application in sparsely settled geographic areas for the purpose of achieving efficiency and effectiveness in providing rural public services. Also, the proposed models attempt to take advantage of the unique characteristics of sparsely settled areas to achieve service delivery integration and economic efficiency in service provision.

Multi-Legged Service Delivery Model

Carl F. Kraenzel argues that the American people, via federal government subsidy, must cooperate to increase the quality and range of rural community services and, at the same time, lower the direct per capita cost to rural residents (59). This premise, of federal government subsidy to rural sparsely settled areas of the region, is basic to his suggestion that "multi-legged service centers" be organized to provide a full range of quality services to rural citizens. Using the multi-legged service center approach, within a sparsely settled geographic area, certain communities would be selected as service providing centers. For example, "Community A" might be designated the mental health and retardation center, "Community B" the vocational rehabilitation and job-training center, and so on. In this way, selected communities within a large geographic

area would be designated as functional service centers for a larger geographic area. Using the multi-legged service center approach, the functional viability of separate, and presently competing, service centers could be enhanced and maintained.

Functional specialization of rural communities is not a new suggestion, but this approach to comprehensive planning for service delivery to rural areas is innovative. Under the multi-legged service center approach, residents of rural, sparsely populated areas would still travel some distance to secure needed services. However, by encouraging selected communities within a sparsely settled area to specialize in the delivery of certain services, the relative inaccessibility of public services (in terms of travel, time, and money expenditures) would be decreased and the functional viability of presently declining rural communities would be enhanced. However, such a system of service delivery depends upon heavy subsidy from federal sources. Kraenzel argues that such subsidy must be provided to enhance the quality of rural life and to maintain rural population levels.

Circuit Rider Approach

Criteria of economic efficiency continue as the most prominent measures employed in determining whether or not a given public service will be provided to a given geographic area. Economies of scale simply cannot be achieved in areas where the population base is small and geographically dispersed. For example, in a comparative study of six counties in the Northern Great Plains, none of the individual communities studied had populations of

sufficient size to economically support comprehensive, quality, public service systems (60:20).

As long as the criteria of economic efficiency are employed, specialized public services must continue to be delivered on a regional basis. For the benefit of clients needing these regional services, a regional centralized service complex is suggested, having a service counseling staff capable of providing comprehensive service counseling. This service complex could provide not only information and service referral, but also space where circuit-riding regional specialists could meet with local clients. Furthermore, in areas having several small population centers, the service counselors could ride circuit on a regular basis to smaller towns. This pattern of service delivery is presently available in some communities in the Northern Great Plains, particularly for provision of mental health, rehabilitation, and mental retardation services.

Integration of the services of circuit riders with other non-governmental or voluntary services available in smaller local communities would also enhance service integration and result in greater effectiveness of existing public services. Although the circuit-rider approach is presently utilized in many rural, sparsely populated areas, oftentimes there is a failure to integrate the specialized services of the circuit rider with the normal day-to-day social services provided by local governmental and voluntary associations. To be optimally effective, greater integration of these various services is recommended.

Technological Model

> Not long ago, as representatives of several human service agencies in the Chattanooga area were meeting, the discussion turned to a woman with grown children who had moved from agency to agency most of her adult life. No agency had ever recommended her for physical examination. One was promptly ordered.
>
> The results indicated the woman was suffering minor brain damage that could be effectively treated with medicine.
>
> Thus, after the woman spent twenty years as a dependent welfare client, we found that she only required a small amount of medication each day to enjoy a normal, productive existence. Unfortunately, she is representative of the literally millions of people nationwide with real needs who are frequently swapped from one agency to another in our cities for treatment of their crises, much as Abraham of old wandered through the land (61:8).

To reduce, and hopefully eliminate, the repeated failures of urban service agencies to effectively diagnose and provide needed client services (as illustrated in the above example), computerized systems have been developed to coordinate and combine the services of a variety of public service agencies. However, the application of computer technology to rural, sparsely settled areas has been more recent. Potentially, the application of computer technology to service delivery can overcome problems of fragmented authority, uncoordinated planning, lack of communication, inadequate and/or duplicate record-keeping, and unclear priorities among the variety of diverse service providers in any community setting. Computer technology could appropriately and successfully be applied to improve the range and quality of rural public services by combining supportive services such as outreach, recruitment, intake, assessment, referral, follow-up, finance, and even transportation.

The absence of medical specialists in rural, sparsely settled areas is particularly severe. Use of computer technology and two-way closed circuit television systems could readily link rural health practitioners with the specialized services and personnel available in urban centers. Case histories could be computerized and readily transmitted to service providers in rural or urban regions as their clients move from one location to another. In special problem cases, relatively isolated service providers would have quick and ready access to consult with specialists in distant urban centers. Obviously, the utilization of such sophisticated technology would be quite costly. However, the quality and range of rural public services would be vastly improved and more effective outcomes achieved. Although immediate financial costs would be high, long-run human resource savings would far outweigh the short-run economic inefficiencies.

Choosing the Best Model

No one service integration model will adequately solve the diverse and multiple problems of coordinated and comprehensive service delivery. For example, one might determine that the "multi-legged service center" approach is most suited to a given rural area, but that elements of the "technological model" or the "circuit-rider model" would be worthwhile supplements.

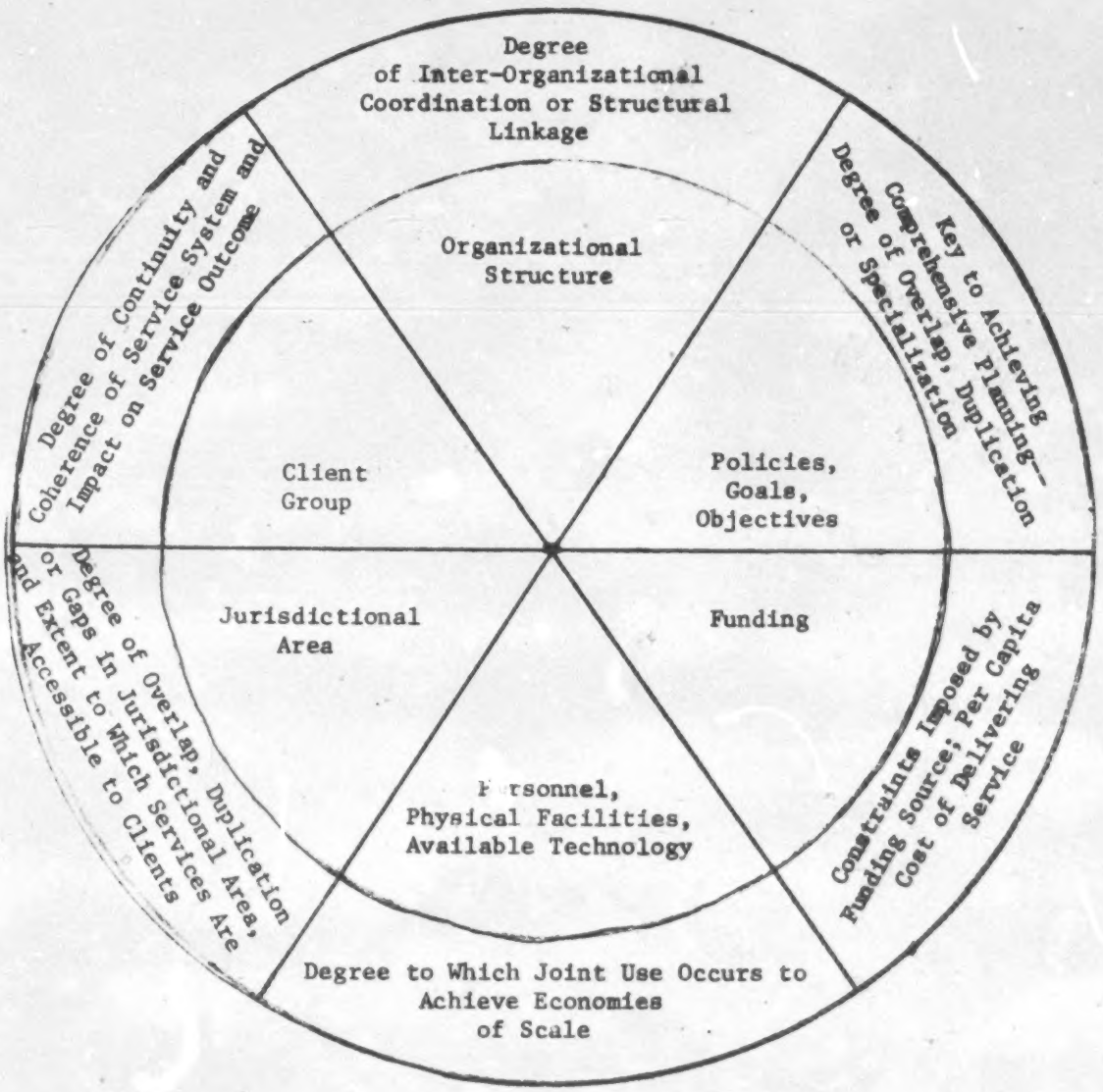
In considering which model might appropriately be applied to a given situation, rural public services must be examined in detail to determine the shortcomings and strengths of the public service delivery arrangement. To illustrate, Figure I depicts six discreet elements of any public service system.

One would want to examine in detail the manner in which the organization is structured and assess the extent to which inter-organizational coordination or structural linkages have been developed among other area service providers. If linkages have not been developed, one would want to determine why. Perhaps an historical pattern of inter-agency jealousy has developed which effectively precludes cooperative planning. Or, perhaps a desire to maintain single agency independence and autonomy has interfered with efforts to integrate services. Or more simply, perhaps no authority has assumed the leadership necessary for the serious consideration of service integration. One would therefore want to identify the reasons for, and obstacles to, structural integration of service organizations.

Analysis of the policies, goals, and objectives of all local service agencies is a prerequisite to achieving coordinated, comprehensive service planning. When policies and goals overlap or where duplication exists, one would want to assess the extent to which functional specialization might lead to greater efficiency and effectiveness of service delivery. Often, funding agencies impose constraints upon service providers. For example, the

FIGURE I

ELEMENTS OF PUBLIC SERVICE SYSTEMS


Degree of Inter-Organizational Coordination or Structural Linkage
Key to Achieving Comprehensive Planning— Degree of Overlap, Duplication or Specialization
Constraints Imposed by Funding Source; Per Capita Cost of Delivering Service
Degree to Which Joint Use Occurs to Achieve Economies of Scale
Degree of Overlap, Duplication or Gaps in Jurisdictional Area, and Extent to Which Services Are Accessible to Clients
Degree of Continuity and Coherence of Service System and Impact on Service Outcome
Organizational Structure
Policies, Goals, Objectives
Funding
Personnel, Physical Facilities, Available Technology
Jurisdictional Area
Client Group

policies and goals of the service agency may be carefully stipulated and controlled by the funding agency. Knowledge of these built-in structural constraints is needed to realistically plan service integration systems.

Knowledge of the per capita cost of providing the service is important, particularly to social planners concerned with the "efficiency" aspects of service delivery. Per capita costs may be reduced by the joint use of service personnel, physical facilities, and expensive service technology (e.g., two-way closed circuit television and computer data processing systems). Therefore, one would want to assess the extent to which joint use of existing resources might be facilitated.

The jurisdictional areas of related service agencies must be carefully reviewed to determine where overlaps as well as gaps in jurisdictions occur. Some service areas may be so large geographically, or some locations within the jurisdiction so isolated, that potential clients do not have access to the service agency. In such cases, the "circuit-rider approach" to service delivery may enhance accessibility and effectively reduce geographic barriers to service entry.

Finally, one would want to carefully evaluate the degree of continuity and coherence of the service delivery system. When different service functions are pursued by separate service agencies without any relationship to one another, incoherence results.

Likewise, discontinuity in service delivery will result when agencies fail to provide component services necessary to achieve desired service outcomes. Analysis of case histories of service clients would be useful in this respect, keeping in mind that the final evaluative criterion is the extent to which the services provided result in the desired service outcome.

Given the social costs of space characteristic of the Northern Great Plains, we have argued that the effectiveness with which service delivery arrangements achieve desired service outcomes is a more important evaluative measure than the economic efficiencies with which services can be delivered. However, in attempting to select the "best" service integration model, public service providers will wish to use both measures of efficiency and of effectiveness. The goal of any public service integration effort is to achieve and enforce structural relationships or linkages among diverse service agencies so that positive service outcomes can be achieved. This is especially so in rural, sparsely settled areas of the nation where the "social costs of space" make it even more difficult to efficiently deliver public services in an effective manner.

APPENDIX A

Table I

SELECTED POPULATION CHARACTERISTICS:
BY COUNTY

COUNTY	Persons Per Square Mile 1970[a]	County Population 1970[a]	County Population 1950[b]	Percentage of Change in Population 1950 - 1970[b] (Percent)	Percentage of Population Residing in County since 1965[c] (Percent)
CUSTER	3.2	12,174	12,661	- 3.8	68
POWDER RIVER	0.9	2,862	2,693	+6.3	60
PHILLIPS	1.0	5,421	6,334	-14.4	80
RICHLAND	4.7	9,837	10,366	- 5.1	75
DANIELS	2.1	3,083	3,946	-21.9	76
McCONE	1.1	2,875	3,258	-11.8	80

SOURCES: [a]Number of Inhabitants, Montana. 1970 Census of Population. U.S. Department of Commerce. Bureau of the Census. PC(1)-A28 Mont. Table 9.
[b]Montana Data Book. Department of Planning and Economic Development, State of Montana--Helena, 4:10, 1970.
[c]U.S. Bureau of the Census, Census of Population: 1970, Vol. 1, Characteristics of the Population, Part 28, Montana, Table 119.

Table II

TOTAL AREA OF COUNTY--
NUMBER OF FARMS--
ACREAGE OF FARMS

COUNTY	Area of County-Acres 1967[a]	Number of Farms 1950[b]	Number of Farms 1969[c]	Average Farm Size (acres) 1950[b]	Average Farm Size (acres) 1969[c]	Percentage of Population in Agriculture 1970[d] (Percent)
CUSTER	2,409,600	506	386	4,768	5,957	13
POWDER RIVER	2,102,400	472	364	3,381	4,655	45
PHILLIPS	3,345,920	803	513	2,220	3,561	36
RICHLAND	1,321,600	1,057	720	1,153	1,741	22
DANIELS	923,520	588	466	1,364	1,803	38
McCONE	1,660,160	675	510	2,066	2,806	46

SOURCES: [a]Montana Data Book. Department of Planning and Economic Development, State of Montana, Helena, 1970, 8:7.
[b]Montana Agricultural Statistics, Montana--Montana Department of Agricultural Labor and Industry and USDA Bureau of Agricultural Economics, 1950 Federal Census, Volume IV, December, 1952.
[c]Montana Agricultural Statistics. Montana Department of Agriculture and Statistical Reporting Service--USDA. County Statistics, 1969 Census of County Agriculture, Volume XIV, December, 1972.
[d]U.S. Bureau of the Census, Census of Population: 1970, Vol. 1, Characteristics of the Population, Part 28, Montana, Table 22.

Table III

AGE AND EDUCATION OF THE POPULATION--
BY COUNTY

COUNTY	Median Age of Population[a] 1970	1960	Educational Level: Median Years Completed 1970[b]
CUSTER	29.2	28.8	12.2
POWDER RIVER	25.1	28.4	12.2
PHILLIPS	29.8	28.9	12.1
RICHLAND	28.0	26.2	11.7
DANIELS	33.9	29.1	12.1
McCONE	28.5	26.5	12.1

SOURCES: [a]General Population Characteristics, Montana 1970 Census of Population, U.S. Department of Commerce, Bureau of the Census, PC(1)-B28 Mont. Table 35.
[b]Number of Inhabitants, Montana. 1970 Census of Population. U.S. Department of Commerce. Bureau of the Census. PC(1)-A28 Mont. Table 9.

Table IV

HOUSING CHARACTERISTICS--
BY COUNTY

COUNTY	Median Value of Housing[a] 1970	Percentage of Delapidated Housing[b] 1966 (Percent)
CUSTER	$13,200	25.9
POWDER RIVER	14,900	47.5
PHILLIPS	11,400	44.4
RICHLAND	13,500	36.5
DANIELS	8,100	43.4
McCONE	8,200	39.1

SOURCES: [a]Detailed Housing Characteristics, Montana 1970 Census of Housing. U. S. Department of Commerce. Bureau of the Census. HC(1)-B28 Mont. Table 61.
[b]Community Profile. Office of Economic Opportunity. Information Center.

Table V

INCOME LEVEL, EMPLOYMENT, AND POVERTY--
BY COUNTY

COUNTY	Median Family Income[a] 1969	Per Capita Income of Persons[a] 1969	Percentage of Civilian Labor Force Unemployed[b] 1970 (Percent)	Percentage of Population Below Poverty Level[c] 1969 (Percent)
CUSTER	$8,373	$2,803	4.7	11.6
POWDER RIVER	7,965	2,906	2.9	13.0
PHILLIPS	7,231	2,449	4.3	16.6
RICHLAND	7,767	2,446	4.4	13.8
DANIELS	7,754	2,576	.4	10.1
McCONE	8,339	3,032	2.3	13.8
MONTANA	8,509	2,687	6.2	13.6

SOURCES: [a]General Population Characteristics, Montana 1970 Census of Population. U.S. Department of Commerce. Bureau of the Census PC(1)-C28 Mont. Table 124.
[b]County and City Data Book 1972, Bureau of the Census, U.S. Department of Commerce, p. 284.
[c]U.S. Bureau of the Census, Census of Population: 1970, Vol. 1, Characteristics of the Population, Part 28, Montana, Table 124.

Table VI

TOTAL AGRICULTURAL LAND, IRRIGATED AND NON-IRRIGATED LAND, AND
ASSESSED VALUE OF AGRICULTURAL LAND--
BY COUNTY

COUNTY	Total of Agricultural Land (1969)[a] (Acres)	Average Assessed Value of all Agricultural Land (1970)[a]	Tillable Non-Irrigated Land (1969)[b] (Acres)	Tillable Irrigated Land (1969)[b] (Acres)	Total Land Under Cultivation (1969)[b] (Acres)
CUSTER	1,852,365	$3.22	53,039	21,540	74,579
POWDER RIVER	1,354,414	$3.75	69,310	3,652	72,962
PHILLIPS	1,578,584	$5.70	305,399	43,396	348,795
RICHLAND	1,179,199	$7.79	380,093	38,359	418,452
DANIELS	646,007	$8.08	416,008	851	416,859
McCONE	1,333,549	$4.85	416,742	2,515	419,257

SOURCES: [a]State of Montana--24th Biennial Report of the Montana State Board of Equalization for the Period July 1, 1968 - June 30, 1970, p. 43.
[b]State of Montana--24th Biennial Report of the Montana State Board of Equalization for the Period July 1, 1968 - June 30, 1970, p. 38.

Table VII

PERCENTAGE OF LAND IN FEDERAL OWNERSHIP - 1970[a]

COUNTY	Percentage
CUSTER	17
POWDER RIVER	28
PHILLIPS	40
RICHLAND	4
DANIELS	0
McCONE	17

[a]Exclusive of Indian lands.

SOURCE: Report on Resources of Eastern Montana, U.S. Department of the Interior, Bureau of Reclamation, Billings, Montana, August, 1972, P. 38.

Table VIII

POPULATION CHANGE (1960-1970)--BY TOWN

COUNTY AND TOWN	Population 1970	Population 1960	Percent Change
CUSTER COUNTY			
Miles City[a]	9,023	9,665	- 6.6
POWDER RIVER COUNTY			
Broadus[b]	799	628	+27.2
PHILLIPS COUNTY			
Malta[b]	2,195	2,239	- 2.0
Saco[b]	356	490	-27.3
Dodson[b]	196	313	-37.4
RICHLAND COUNTY			
Sidney[b]	4,543	4,564	- 0.5
Fairview[b]	956	1,006	- 5.0
Savage[b]	---	---	---
Lambert[b]	---	---	---
Crane[b]	---	---	---
DANIELS COUNTY			
Scobey[b]	1,486	1,726	-13.9
Flaxville[b]	185	262	-29.4
McCONE COUNTY			
Circle[b]	964	1,117	-13.7

SOURCES: [a]Number of Inhabitants Montana. 1970 Census of Population, U.S. Department of Commerce. Bureau of the Census PC(1) A28 Mont. Table 10.
[b]Montana Data Book, Department of Planning and Economic Development, State of Montana, Helena, 1970, p. 4:17.

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